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## (54) A method and an apparatus to prevent latchup in a CMOS device.

(57) An apparatus and a method is disclosed to prevent latchup in a CMOS device and, in particular, during the power-up phase of the CMOS device . A switching transistor is interposed between the power $V_{DD}$ and the P-channel transistors. A control circuit controls the switching transistor, such that the switching transistor is turned off when power is initially applied to the CMOS device. The substrate of either the N channel MOS transistor or the P channel MOS transistor, preferably both, is biased with the latter being biased above $V_{DD}$ and the former being biased to a negative potential. Once the substrate of the N channel MOS transistor and the P channel MOS transistor are biased, the switching transistor is then turned on permitting power to be applied to the P channel transistors.

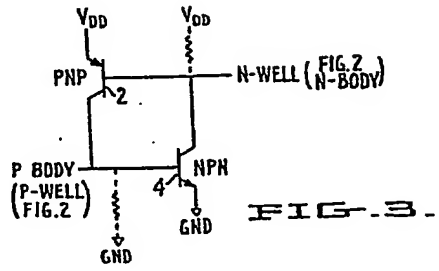


FIG-3.

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# EUROPEAN SEARCH REPORT

Application number

EP 85 11 0330

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
|---|---|---|---|
| X | US-A-4 039 869 (RCA)<br>* Column 2, line 7 - column 3, line 18; column 4, lines 40-62; figure 1 * | 1-3,7, 9,10 | G 05 F 3/20 |
| A | US-A-4 260 909 (BELL)<br>* Abstract; figure 1 * | 1,4,8 | |
| A | US-A-4 109 161 (NEC)<br>* Abstract; column 1, line 58 - column 2, line 4; figure 1 * | 1,7,9, 12 | |
| A | EP-A-0 036 494 (SIEMENS)<br>* Abstract; figure 1 * | 1 | |
| A | IEEE INTERNATIONAL SOLID-STATE CIRCUITS CONFERENCE, 13th February 1980, pages 58,59, New York, US; A.C. GRAHAM et al.: "Battery backup circuits for memories"<br>* Whole document * | 1 | TECHNICAL FIELDS SEARCHED (Int. Cl.4)<br>G 05 F 3/00<br>H 02 M 3/00<br>H 01 L 27/08 |
| A | PATENTS ABSTRACTS OF JAPAN, vol. 7, no. 140 (E-182)[1285], 18th June 1983; & JP - A - 58 52 869 (NIPPON DENKI K.K.) 29-03-1983<br>* Whole abstract * | 5,6 | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 25-08-1986 | ZAEGEL B.C. |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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